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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
AKANBI, ISIAKA O	

ART UNIT	PAPER NUMBER
2886	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
mkraft@hp.com
ipa.mail@hp.com

Office Action Summary	Application No.	Applicant(s)	
	10/658,939	GILA ET AL.	
	Examiner	Art Unit	
	ISIAKA O. AKANBI	2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *04 February 2008*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Amendment

The amendment filed on 04 February 2008 has been entered into this application. Claims 45-46 have been added.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 13-15, 17-36 and 38-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Hubble, III et al. (6,384,918 B1).

Regarding claim 1, Hubble discloses a method for measuring optical density comprising of the following:

using a controller (fig. 2: 100)(applicant's electrical circuitry),

circuitry such as that of FIG. 3, or otherwise, to accurately multiply read (determining) **plural different color test patches** (color on an area) **such as 31 printed on moving color test sheets 30 such as those shown in FIG. 4 (fig. 2) (fig. 3)(col. 11, lines 45-52)(see abstract, lines 1-7)** (applicant's determining a color on an area);

using a controller (electrical circuitry) **(fig. 2: 100), with color tests, selected by the controller (100)(col. 12, lines 12-16), as particularly shown in FIG. 2, that**

illumination by any one of the LED's provides various levels of light reflected (i.e. the degree/measure of the opacity of a substance that transmits light or density) from that target (depending on the respective colors of both the test patch and the selected illumination source)(col. 12, line 64-col. 13, line 3)(see abstract, lines 1-7)(applicant's electrical circuitry, selecting, based on the color, one of a plurality of different illumination sources appropriate to determine optical density (measure of the transmittance or transmittance through an optical medium) of the color on the area);

the spectrophotometer 12 (device for measuring transmittance or reflectance), although compact, has 10 different color sampling illumination sources, provided by 10 circularly mounted and sequentially operated LED's, D1 through D10, each with different color filters, such as 16 and 17, but each having the same simple condenser lens such as 18 and 19 for directing the respective LED's output uniformly onto the same target area, as especially shown in FIGS. 1 and 2, and further described with reference to FIG. 3. The normal target area in the system 10 embodiment herein, of course, is a color test patch 31(D1-D10)(col. 12, lines 56-67)(applicant's illuminating the area with the selected illumination source);

As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source) a portion of which is collected by the single central lens 13, and focused by that lens 13 onto, and around (by overfill) a single photosensor D12. FIG. 2 illustrates with dashed line light rays both the LED illumination and the focusing by a

projection lens 13 (a simple two-element lens in this example 13) of three exemplary target points A, B and C onto the focal plane of lens 13 as C', B' and A', of which B is in the center of the target, and has its image point in the center of the photosensor D12, while A and B are outside or inside the test patch 31 area and image points B' and A' outside the (small fixed) area of the photosensor D12 (col. 12, lines 67-col. 13, line 13)(applicant's receiving radiation from the area responsive to the illuminating); and

By recording the detector D12 outputs when a test patch is successively illuminated by each individual LED, the reflectance of the test patch as a function of different wavelengths can be determined, and with ten or more different LED output wavelengths as in this spectrophotometer 12 example, that reflectance of the test patch as a function of different wavelengths can be extrapolated or interpolated over the entire visible spectra (col. 17, lines 6-14). Ten different reflectances from a sample color test patch from ten different LED's with ten different narrow wavelength bands provides 10 sampled points which can be converted to a much larger number of reflectance values at small nm increments using an optimized color lookup table (col. 17, lines 39-44). As also illustrated in the example of FIG. 3, at the right hand side, the relative reflectance of each actuated LED's color or wavelength is measured by conventional circuitry or software for amplifying 112 and integrating 114 the output of the photodiode detector D12, and directing this signal or information to a sample and hold stage 116 (col. 17, lines 50-65)(applicant's converting the received radiation to a signal

indicative of optical density (measure of the transmittance or reflectance through an optical medium) of the color on the area).

As to claim 2, Hubble also discloses wherein the signal indicative of optical density comprising a standardized signal indicative of standardized optical density (measure of the transmittance or reflectance through an optical medium)**(col. 3, line 38-42)(col. 14, line 35-44).**

As to claims 3 and 5, Hubble also discloses the limitations wherein selecting a look-up table based on the color on the area, wherein the look-up table associates the received radiation with a standardized signal indicative of standardized optical density and generating a look-up table for converting the received radiation to the standardized signal indicative of standardized optical density **(col. 6, line 64-67)(col. 7, line 41-49).**

As to claim 4, Hubble also discloses wherein the selected illumination source provides illumination having a first spectrum and said converting comprises compensating for at least one difference between the first spectrum and a standard spectrum to generate the standardized signal indicative of standardized optical density **(col. 7, line 24-50).**

Regarding claim 13, Hubble discloses a densitometer (device for measuring the optical density (measure of the transmittance or reflectance through an optical medium or a material) comprising:

the spectrophotometer 12, although compact, has 10 different color sampling illumination sources, provided by 10 circularly mounted and

sequentially operated LED's, D1 through D10 for directing the respective LED's output onto target area (col. 12, lines 56-57)(figs. 2 and 3: D1-D10 and 30/31)(applicant's at least a first illumination source to illuminate an area);

Trichometric quantities may be used for representing color in three coordinate space through some type of transformation. Other RGB (i.e. radiation/illumination) conversions to "device independent color space" (i.e., RGB converted to conventional L*a*b*) typically use a color conversion "lookup table" system in a known manner. (Examples are provided in patents cited below, and elsewhere.)(col. 2, lines 29-35) and a spectrophotometer programmed to give more detailed reflectance values by using more than 3 channel measurements (e.g., 10 or more channel measurements), with conversion algorithms (col. 2, lines 29-35)(applicant's sensor for converting radiation received from the area);

The disclosed system may be connected, operated and controlled by appropriate operation of conventional control systems. It is well known and preferable to program and execute various control functions and logic with software instructions for conventional or general purpose microprocessors, as taught by numerous prior patents and commercial products. Such programming or software may of course vary depending on the particular functions, software type, and microprocessor or other computer system utilized, but will be available to, or readily programmable without undue experimentation from, functional descriptions, such as those provided herein, and/or prior knowledge of functions which are conventional, together with general knowledge in the software and

computer arts. Alternatively, the disclosed control system or method may be implemented partially or fully in hardware, using standard logic circuits or single chip VLSI designs (col. 10, lines 46-62) and After the spectrophotometer or other color sensor reads the colors of the test patches, the measured colors may be processed inside the system controller or the printer controller to produce or modify the tone reproduction curve (Col. 4, lines 14-17) (applicant's processor coupled to the sensor for converting the received radiation (i.e. RGB converted to conventional L*a*b* data/standard) to a standardized signal indicative of standardized optical density (measure of the transmittance or reflectance through an optical medium or a material).

As to claims 14 and 15, Hubble also discloses plurality of illumination sources **(fig. 2: D1-D10)** and wherein the plurality of illumination sources comprising light emitting diodes **(fig. 2)(col. 9, line 20-30)(col. 12, line 59).**

As to claim 17, Hubble also discloses **As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source)(col. 12, lines 67-col. 13, line 3)(figs. 2 and 3: 100); Trichometric quantities may be used for representing color in three coordinate space through some type of transformation. Other RGB (i.e. radiation/illumination) conversions to "device independent color space" (i.e., RGB converted to conventional L*a*b*) typically use a color conversion "lookup table" system in a known manner. (Examples are provided in patents cited below,**

and elsewhere.)(col. 2, lines 29-35) and a spectrophotometer programmed to give more detailed reflectance values by using more than 3 channel measurements (e.g., 10 or more channel measurements), with conversion algorithms (col. 2, lines 29-35); In order to be compatible with industry standards set forth by the CIE, ASTM, and others the test patch illumination for color measurement should be at 45 degrees to the surface of the media on which the color test patch is printed. Also for that standard, the color test patch measurement should be performed using flux diffusely scattered from the (so-illuminated) test patch at 90 degrees (perpendicular) to that color test patch surface. As may be seen, this is provided by the spectrophotometer 12 (col. 14, line 35-44)(applicant's wherein the processor is further configured to determine a color of the area and select (an) one of a plurality of different illumination sources to determine the-standardized optical density of the color of the area, and wherein the selection is responsive to the determination of the color).

As to claim 18, Hubble also discloses a memory coupled to the processor (100), wherein the memory stores a look-up table for converting the received radiation to the standardized signal indicative of standardized optical density **(fig. 2)(col. 13, line 49-57)(col. 19, 1-7).**

As to claim 19, Hubble also discloses wherein the first illumination source is selected from a plurality of illumination sources selected from the set consisting of red, green, blue, and orange **(fig. 3)(col. 6, line 55-col. 7, line 1-18).**

As to claim 20, Hubble further discloses wherein the first illumination source is selected from the plurality of illumination sources based on the source having [[an]] a color that is substantially a color complement to an area of a media to be measured **(fig. 2)(col. 8, line 41-67)(col. 12, line 56-col. 13, line 1-6).**

As to claims 21 and 40, Hubble further discloses **It will also be appreciated that these test patch images and colors may be automatically sent to the printer imager from a stored data file specifically designed for printing the dual mode banner sheet or other color test sheet page, and/or they may be embedded inside the customer job containing the banner page. That is, the latter may be directly electronically associated with the electronic document to be printed, and/or generated or transmitted by the document author or sender (col. 4, lines 5-13); By way of further background on the subject of technology for automatic color correction for color printers or other reproduction apparatus, especially such systems utilizing feedback signals from a calorimeter or spectrophotometer (as noted, those terms may be used interchangeably herein), and/or automatically measuring the actually printed colors of test patches on printed copy sheets as they are being fed through the output path the printer,(col. 6, lines 1-8)** (applicant's memory for receiving and storing data regarding inks used to print one or more areas to be measured, and means for accessing the stored data to determine the color printed on an area), **Where one or more test sheets 30 are being printed instead of normal document images (at times, and with color tests, selected by the controller**

100)(col. 12, lines 12-14), and As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source)(col. 12, lines 67-col. 13, line 3)(figs. 2 and 3: 100)(applicant's data being used to select a spectral wavelength of the at least a first illumination source) **accurately provide measurements of colors printed on the moving copy sheets as they pass the spectrophotometer (col. 1, lines 34-35)(fig. 2),**(applicant's using data generated during printing of a marking agent on the area).

As to claims 22 and 23, Hubble also discloses wherein the at least a first illumination source to illuminate an area is exactly a single illumination source having a spectral wavelength range narrower than the spectrum of visible white light and a light emitting diode having one of a red, green, blue, orange color spectral output **(fig. 3)(col. 2, line 4-28)(col. 6, line 55-col. 8, line 1-67).**

As to claim 24, Hubble also discloses an article printed using the method of measuring optical density of claim 1 **(col. 7, line 48-49).**

As regard to claim 25, Hubble discloses a printing apparatus (fig. 5) comprising:

FIG. 5 schematically shows one example of an otherwise conventional color printer printing the test sheets of FIG. 4 and sequentially reading those test sheets while the test sheets are moving in their normal output path near the output of with the spectrophotometer of FIGS. 1 and 2, which is shown here

mounted at one side of that sheet output path(fig. 5: 20)(col. 11, line 36-42)(applicant's means for printing at least one ink on an area);

A specific feature of the specific embodiment(s) disclosed herein is to provide in a color correction system for a color printer with an output path for printed color sheets, including printed test sheets with printed color test patches, in which a spectrophotometer is mounted in said printer output path for sensing the colors printed on a test patch on a test sheet as said test sheets are moving past said spectrophotometer in said printer output path, wherein said spectrophotometer includes a plurality of illumination sources for sequentially illuminating a said test patch with different illumination colors, a photodetector sensor providing electrical output signals, and a lens system for transmitting said illumination from said test patch to said photodetector sensor, whereby said photodetector sensor provides different said electrical output signals in response to viewing said different illumination colors from said sequential illuminations of said test patch by said plural illumination sources (col. 8, lines 41-57);

the spectrophotometer 12 (device for measuring transmittance or reflectance) is mounted at one side of that output path 40 (or, in the output tray 44) to regularly sense the actual, fused, final colors being printed, providing the input for the on-line color sensing and correction system 10, with controller 100 and/or interactive circuitry and/or software. The controller 100, and sheet sensors along the machine 20 paper path, conventionally controls the feeding and tracking of sheet positions within the printer paper path (col. 12, lines 24-

32)(fig. 2: 12, 100)(applicant's controller coupled to the means for printing; and a densitometer (device for measuring the optical density (measure of the transmittance or reflectance through an optical medium or a material) coupled to the controller),

the spectrophotometer 12, although compact, has 10 different color sampling illumination sources, provided by 10 circularly mounted and sequentially operated LED's, D1 through D10, each with different color filters, such as 16 and 17, but each having the same simple condenser lens such as 18 and 19 for directing the respective LED's output uniformly onto the same target area, as especially shown in FIGS. 1 and 2, and further described below with reference to FIG. 3. The normal target area in the system 10 embodiment herein, of course, is a color test patch 31(col. 12, lines 56-66)(figs. 2 and 5: 10, 12, 30, 31)(applicant's densitometer positioned to illuminate the area) and

An accurate color control system, as disclosed herein, can thus provide regularly for testing and storing current machine color printing responses to color printing input signals (an up-to-date model) for remapping LAB (or XYZ) "device independent" color inputs (for later conversion to device dependent RGB or CMYK color space for printing). That information can also be profiled into a system or network server for each different machine (and/ or displayed on a CRT controller for color manipulation)(col. 13, lines 49-57); FIG. 5 schematically shows one example of an otherwise conventional color printer printing the test sheets of FIG. 4 and sequentially reading those test sheets while the test sheets are moving in their normal output path near the output of with the spectrophotometer of

FIGS. 1 and 2, which is shown here mounted at one side of that sheet output path. It will be appreciated that different colors are represented in the Figs., especially in FIG. 4, by their standard U.S. Patent Office black and white cross-hatching symbols (figs. 3 and 4)(col. 11, line 37-45); In order to be compatible with industry standards set forth by the CIE, ASTM, and others the test patch illumination for color measurement should be at 45 degrees to the surface of the media on which the color test patch is printed. Also for that standard, the color test patch measurement should be performed using flux diffusely scattered from the (so-illuminated) test patch at 90 degrees (perpendicular) to that color test patch surface. As may be seen, this is provided by the spectrophotometer 12 (col. 14, line 35-44)(applicant's generate a standardized signal indicative of standardized optical density (measure of the transmittance or reflectance through an optical medium or a material) of the area responsive to the illumination).

As to claim 26, Hubble also discloses wherein the densitometer comprising at least one light emitting diode **(D1-D10)(col. 12, line 59).**

As to claim 27, Hubble also discloses a sensor **(fig. 2: 12)** positioned to receive radiation from the area **(fig. 5).**

As to claim 28, Hubble also discloses **the spectrophotometer 12 is mounted at one side of that output path 40 (or, in the output tray 44) to regularly sense the actual, fused, final colors being printed, providing the input for the on-line color sensing and correction system 10, with controller 100 and/or interactive circuitry**

and/or software (col. 12, lines 24-29 and lines 33-41)(applicant's wherein the densitometer is configured to determine the color of ink printed on the area) and

As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source)(col. 12, lines 67-col. 13, line 3)(figs. 2 and 3: 100)(applicant's select at least one of a plurality of different illumination sources for the illumination and corresponding to the determination of the color of ink **(col. 8, line 41-67).**

As to claim 29, Hubble also discloses printing media printed with the printing apparatus **(fig. 5) of claim 25 (col. 12, line 26).**

As to claims 30-32, Hubble also discloses the limitation wherein the determining comprising using data regarding a marking agent (i.e. ink) or dye used to print the color on the area **(col. 7, lines 1-7)(fig. 2: 30/31);** and

such an improved spectrophotometer to be part of a color measurement system in which it may be mounted in a color printer, preferably in the paper path of the moving copy sheets, without having to otherwise modify the printer, or interfere with or interrupt normal printing, and yet accurately provide measurements of colors printed on the moving copy sheets as they pass the spectrophotometer. The disclosed improved spectrophotometer is thus especially suitable for an on-line color control and correction systems for color printers, for measuring the colors of moving image substrates, especially print sheets printed with selected color test patches. It enables a complete closed loop

color control of a printer. However, the present invention is not limited thereto. Color measurements, and/or the use of color measurements for various quality or consistency control functions, are also important for many other different technologies and applications, such as in the production of textiles, wallpaper, plastics, paint, inks,(col. 1, lines 28-45)(applicant's wherein image data is used to print the color on the area, and wherein the data regarding the marking agent is accessed from the image data (i.e. colors printed).

As to claims 33 and 36, Hubble also discloses **accurately provide measurements of colors printed on the moving copy sheets as they pass the spectrophotometer (col. 1, lines 34-35), thus meeting the applicant limitations** wherein the data is provided during the printing of the marking agent on the area and the data indicates the color of the marking agent (i.e. ink or dye) used to print the color on the area and determining before
completion of printing of the color on the area.

As to claim 34, Hubble also discloses **the disclosed improved spectrophotometer is thus especially suitable for an on-line color control and correction systems for color printers, for measuring the colors of moving image substrates, especially print sheets printed with selected color test patches. It enables a complete closed loop color control of a printer (col. 1, line 31-40);The controller 100, and sheet sensors along the machine 20 paper path, conventionally controls the feeding and tracking of sheet positions within the**

printer paper path. The controller 100 and/or a conventional sensor for fiduciary marks 33 or the like on each test sheet 30 can provide control or actuation signals to the spectrophotometer 12 circuitry for the spectrophotometer 12 to sequentially test or read the colors of each of the test patches 31 on the test sheet 30 as that test sheet 30 moves past the spectrophotometer 12 in the output path 40, as will be further described. The test patches 31 can be variously located and configured, as blocks, strips, or otherwise, of various digitally selected solid color images (col. 12, lines 32-41); It will also be appreciated that these test patch images and colors may be automatically sent to the printer imager from a stored data file specifically designed for printing the dual mode banner sheet or other color test sheet page, and/or they may be embedded inside the customer job containing the banner page. That is, the latter may be directly electronically associated with the electronic document to be printed, and/or generated or transmitted by the document author or sender (col. 4, lines 5-14)(applicant's accessing the data from storage circuitry).

As to claim 35, Hubble also discloses **after the spectrophotometer or other color sensor reads the colors of the test patches, the measured colors may be processed inside the system controller or the printer controller to produce or modify the tone reproduction curve. The color test patches on the next banner page, and the customer document pages of the next print job may then be printed with that new tone reproduction curve (col. 4, lines 14-20)**(applicant's determining without sensing of the area).

As to claim 41, Hubble discloses **spectrophotometer is thus especially suitable for an on-line color control and correction systems for color printers, for measuring the colors of moving image substrates, especially print sheets printed with selected color test patches. It enables a complete closed loop color control of a printer. However, the present invention is not limited thereto. Color measurements, and/or the use of color measurements for various quality or consistency control functions, are also important for many other different technologies and applications, such as in the production of textiles, wallpaper, plastics, paint, inks, etc. (col. 1, lines 35-45)**(applicant's means for providing data regarding the at least one ink), and **As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source) (col. 12, lines 67-col.13, line 3)**(applicant's one of a plurality of different illuminant sources of the densitometer is selected for the illumination using the data regarding the at least one ink).

As to claim 42, Hubble discloses **accurately provide measurements of colors printed on the moving copy sheets as they pass the spectrophotometer (col. 1, lines 34-35), thus meeting the applicant limitation** (applicant's data is provided before completion of the printing of the at least one ink on the area).

As to claims 38, 39, 43 and 44, Hubble discloses **Trichometric quantities may be used for representing color in three coordinate space through some type of transformation. Other RGB (i.e. radiation/illumination) conversions to "device**

independent color space" (i.e., RGB converted to conventional L*a*b*) typically use a color conversion "lookup table" system in a known manner. (Examples are provided in patents cited below, and elsewhere.)(col. 2, lines 29-35) and a spectrophotometer programmed to give more detailed reflectance values by using more than 3 channel measurements (e.g., 10 or more channel measurements), with conversion algorithms (col. 2, lines 29-35);In order to be compatible with industry standards set forth by the CIE, ASTM, and others the test patch illumination for color measurement should be at 45 degrees to the surface of the media on which the color test patch is printed. Also for that standard, the color test patch measurement should be performed using flux diffusely scattered from the (so-illuminated) test patch at 90 degrees (perpendicular) to that color test patch surface. As may be seen, this is provided by the spectrophotometer 12 (col. 14, line 35-44)(applicant's wherein the standardized optical density provides optical density information in accordance with a standard predefined before the conversion of the received radiation to the standardized signal and wherein the processor is configured to convert the received radiation to a signal indicative of optical density and lo convert the signal indicative of optical density to the standardized signal indicative of standardized optical density).

As to claim 45, Hubble also discloses the limitation wherein the illuminating comprises illuminating only using the selected one **(the first LED that is sequentially actuated to sequentially illuminate the target)** of the different illumination sources **(LEDs, D1 through D2)**, the receiving comprises receiving the radiation responsive

(reflected light) to the illuminating using only the selected one of the different illumination sources, and the converting comprises converting only the received radiation to the signal indicative of the optical density **(measure of the transmittance or reflectance through an optical medium or a material)** of the color on the area **(fig. 2: 30)(col. 17, lines 6-8, lines 45-50)(col. 18, lines 54-59)(col. 18, lines 23-27).**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6-8 and 16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Hubble, III et al. (6,384,918 B1) in view of Yamanishi et al. (4,986,665)

As to claims 6 and 7, Hubble teaches of the features of claim 1, comprising illumination source and the signal **(reflected light)** indicative of optical density **(LEDs D1-D10)(col. 8, line 41-67)(col. 12, 56-67).**

Hubble is silent regarding compensating for the effects of heating of the selected illumination source during illumination of the area and measuring the voltage across the light emitting diode.

Yamanishi teaches of compensating for the effects of heating of the selected illumination source during illumination of the area and measuring the voltage across the light emitting diode **(col. 17, line 29-col. 18, line 1-50)(col. 26, line 15-60)(col. 17, line 9-28).**

It would have been obvious to one having ordinary skill in the art at the time of invention to provide compensation for the effects of heating of the selected illumination source during illumination of the area and measure the voltage across the light emitting diode for the purpose of measuring value with high accuracy.

As to claim 8, Hubble when modify by Yamanishi discloses everything claimed, as applied to claim 7 above, in addition Hubble discloses generating a corrected signal indicative of optical density (measure of the transmittance or reflectance through an optical medium or a material) using a non-linear relationship **(col. 7, line 7-40).**

Claims 9-12 and 37 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Hubble, III et al. (6,384,918 B1).

Regard claim 9, Hubble teaches of a method for calibrating a printing apparatus comprising of the following:

embodiment provide dual-mode color test sheets/banner sheets, in which multiple color patches of different colors are printed on otherwise blank areas of each, or selected, banner, cover, or other inter-document or print job separator sheets (col. 3, lines 15-21); color printing color calibration or correction system which regularly measures the actual colors then being printed on printed sheets being outputted by the printer, as compared to the intended (or selected, or "true") colors of the electronic document images being inputted to the printer for printing (col. 3, lines 37-42) and The controller 100 and/or a conventional sensor for fiduciary marks 33 or the like on each test sheet 30 can provide control or actuation signals to the spectrophotometer 12 circuitry for the spectrophotometer 12 to sequentially test or read the colors of each of the test patches 31 on the test sheet 30 as that test sheet 30 moves past the spectrophotometer 12 in the output path 40, as will be further described. The test patches 31 can be variously located and configured, as blocks, strips, or otherwise, of various digitally selected solid color images. Thus, in the disclosed embodiment, plural test sheets 30 of paper or other image substrate material being printed by the color printer 20 can be

automatically printed with pre-programmed plural test patches 31 of defined colors, preferably with associated simple fiduciary marks for signaling the reading location of each colored test patch on the test sheet (col. 12, lines 32-48) (applicant's printing an area having a color; based on the color,)

As particularly shown in FIG. 2, that illumination by any one of the LED's provides various levels of light reflected from that target (depending on the respective colors of both the test patch and the selected illumination source) (col. 12, lines 67-col.13, line 3)(applicant's selecting one of a plurality of different illumination sources in a densitometer (device for measuring the optical density (measure of the transmittance or reflectance through an optical medium or a material).

the spectrophotometer 12 (device for measuring transmittance or reflectance), although compact, has 10 different color sampling illumination sources, provided by 10 circularly mounted and sequentially operated LED's, D1 through D10, each with different color filters, such as 16 and 17, but each having the same simple condenser lens such as 18 and 19 for directing the respective LED's output uniformly onto the same target area, as especially shown in FIGS. 1 and 2, and further described with reference to FIG. 3. The normal target area in the system 10 embodiment herein, of course, is a color test patch 31(D1-D10)(col. 12, lines 56-67)(figs. 2 and 3: D1-D10)(applicant's illuminating the area using the selected illumination source);

By recording the detector (figs. 2 and 3: D12) outputs when a test patch is successively illuminated by each individual LED, the reflectance of the test patch

as a function of different wavelengths can be determined, and with ten or more different LED output wavelengths as in this spectrophotometer 12 example, that reflectance of the test patch as a function of different wavelengths can be extrapolated or interpolated over the entire visible spectra (col. 17, lines 6-14). Ten different reflectances from a sample color test patch from ten different LED's with ten different narrow wavelength bands provides 10 sampled points which can be converted to a much larger number of reflectance values at small nm increments using an optimized color lookup table (col. 17, lines 39-44). As also illustrated in the example of FIG. 3, at the right hand side, the relative reflectance of each actuated LED's color or wavelength is measured by conventional circuitry or software for amplifying 112 and integrating 114 the output of the photodiode detector D12, directing this signal or information to a sample and hold stage 116 (col. 17, lines 50-65) and provide a photodetector D12 signal for each which can be electronically compared to previously stored white tile characteristics in the controller 100 (col. 18, lines 54-59) (applicant's receiving a signal indicative of optical density in the area from the densitometer after the selecting).

Hubble fails to specifically specify that selecting one of a plurality of different illumination sources in a system (12) is automatically selected without user input.

However, it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to automatically select one of a plurality of different illumination sources in a (i.e. densitometer or spectrophotometer) without user input, since it has been held that broadly providing a mechanical or automatic means to

replace manual activity which has accomplished the same result involves only routine skill in the art. In re Venner, 120 USPQ 192.

As to claims 10 and 11, Hubble also discloses wherein the printing comprising printing a plurality of areas **(fig. 3: 30/31)**, each having a color and the receiving comprising receiving **(fig: D12)** a signal indicative of optical density in each of the areas and a standardized signal indicative of standardized optical density **(figs. 2 and 3)(col. 3, line 15-46)(col. 7, line 24-49)(col. 14, line 35-44).**

As to claim 37, Hubble discloses **an on-line color control and correction systems for color printers, for measuring the colors of moving image substrates, especially print sheets printed with selected color test patches. It enables a complete closed loop color control of a printer. However, the present invention is not limited thereto. Color measurements, and/or the use of color measurements for various quality or consistency control functions, are also important for many other different technologies and applications, such as in the production of textiles, wallpaper, plastics, paint, inks, etc (col. 1, lines 36-45)** (applicant's wherein the printing comprises providing data regarding a color of a marking agent (i.e. ink) used for the printing), and

It is quite common for shared user printers, even those with mailbox system job separators, to automatically generate and print a color test sheets/banner sheets immediately preceding the first page of each actual document being printed, with the banner sheet containing a limited amount of

printed information about that print job and/or user (col. 3, line 26-32)(applicant's wherein the automatically selecting comprises selecting using the data).

As to claim 46, Hubble also discloses the limitation wherein the illuminating comprises illuminating only using the selected one **(the first LED that is sequentially actuated to sequentially illuminate the target)** of the different illumination sources **(LEDs, D1 through D2)**, the receiving comprises receiving the radiation responsive **(reflected light)** to the illuminating using only the selected one of the different illumination sources, and the converting comprises converting only the received radiation **(reflected light)** to the signal indicative of the optical density **(measure of the transmittance or reflectance through an optical medium or a material)** of the color on the area **(fig. 2: 30)(col. 17, lines 6-8, lines 45-50)(col. 18, lines 54-59)(col. 18, lines 23-27).**

Claims 12 and 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Hubble in view of Yamanishi.

As to claims 12 and 16, Hubble teaches of the features of claims comprising illumination sources **(fig. 2) (LEDs D1-D10)**.

However Hubble is silent regarding compensating for the effects of heating of the selected illumination source during illumination of the area.

Yamanishi teaches of compensating for the effects of heating of the selected illumination source during illumination of the area **(col. 17, line 29-col. 18, lines 1-50) (col. 26, line 15-60).**

It would have been obvious to one having ordinary skill in the art at the time of invention to provide compensation for the effects of heating of the selected illumination source during illumination of the area for the purpose of measuring value with high accuracy.

Response to Arguments

Applicant's arguments/remarks, see pages 9-12, filed on 04 February 2008, with respect to the rejection(s) of claim(s) 1-44 under U.S.C. 102(b) and 35 U.S.C. 103(a) have been fully considered but are not persuasive.

In response to Applicant's arguments that Hubble fails to disclose or suggest any teachings regarding an illumination source let alone selecting one of a plurality of different illumination sources as recited claim 1, it is respectfully pointed out to applicant that this argument is not persuasive as Hubble clearly disclose in **(col. 12, line 64-col. 13, line 3)** and shows in **(figs. 2 and 3)** these limitations. To further clarify, Hubble discloses LED's, D1 through D10, which are illumination sources, any one of the LED's provides various levels of light reflected from that target **(test patch)** depending on the respective colors "based on the color" of both the test patch and the selected illumination source for color measurement (measure of the transmittance or

transmittance through an optical medium) “one of a plurality of different illumination sources appropriate to determine optical density of the color on the area”.

In response to Applicant’s arguments that Hubble fail to disclose or suggest any teachings regarding optical density let alone the claimed converting the received radiation to a signal indicative of optical density of the color on the area as specifically claimed, it is respectfully pointed out to applicant that this argument is not persuasive as Hubble clearly discloses in **(col. 17, line 39-44 and lines 50-65)** these limitations. As pointed out in the Office action, Hubble teaches that illumination by any one of the LED's provides various levels of light reflected (i.e. the degree/measure of the opacity of a substance that transmits light or density) from that target **(col. 12, line 64-col. 13, line 3)(see abstract, lines 1-7)**, which means measurement of the transmittance or reflectance through an optical medium, which is optical density, as the light reflected “received radiation” is the degree/measure of the opacity of a substance that transmits light or density of the test patch “optical density of the color on the area”. Further Hubble teaches that different reflectance the degree/measure of the opacity of a substance that transmits light or density of the test patch “optical density” or “received radiation(s)” from a sample color test patch from different LED's with different narrow wavelength bands provides sampled points which can be converted to a much larger number of reflectance values at small nm increments using an optimized color lookup table **(col. 17, lines 39-44)**.

Applicant further argues that the Office has failed to establish a proper prima facie 103 rejection inasmuch as positively-recited limitations of the claims are not taught

by the prior art. In particular, that the teachings Hubble fail to disclose or suggest any selection let alone the recited based on the color, automatically selecting one of a plurality of different illumination sources in a densitometer as specifically claimed in instant claim 9.

To clarify, by applicant's own account the rejection was made as 103 not 102 and the examiner did recognize that the limitation "automatically selecting one of a plurality of different illumination sources in a densitometer" was not explicitly taught by Hubble but used obviousness to find this limitation. It is respectfully pointed out to applicant that this argument is not persuasive as details in the response to similar arguments above. Hubble teaches **(col. 12, lines 56-col. 13, line 3)** a device/system spectrophotometer for measuring the optical density (measure of the transmittance or reflectance through an optical medium or a material), which is equivalent to "densitometer". Hubble fails to explicitly specify that selecting one of a plurality of different illumination sources in a system is automatically selected without user input.

However, it would have been at least obvious to one having ordinary skill in the art at the time of invention was made to automatically select one of a plurality of different illumination sources in a (i.e. densitometer or spectrophotometer) without user input, since it has been held that broadly providing a mechanical or automatic means to replace manual activity which has accomplished the same result involves only routine skill in the art. In re Venner, 120 USPQ 192.

In response to Applicant's arguments that Hubble fails to teach or suggest the claimed limitations of the processor coupled to the sensor for converting the received

radiation to a standardized signal indicative of standardized optical density, as recited in claims 13 and 25, it is respectfully pointed out to applicant that this argument is not persuasive as Hubble clearly disclose in **(col. 12, lines 10-67)(col. 10, lines 46-62)(col. 13, line 49-57)(col. 19, lines 1-7)** and shows in **(figs. 2 and 3)** these limitations.

To further clarify, Hubble disclose a device/system spectrophotometer for measuring the optical density (measure of the transmittance or reflectance through an optical medium or a material), which is equivalent to "densitometer" and shows a processor (100) couple or connected photosensor, which is a sensor. The processor received reflected color which is "received radiation" the degree/measure of the opacity of a substance that transmits light or density. The light that is reflected meets the claim limitation "signal". Also, it is submitted that the different colors (i.e. RGB converted to conventional L*a*b*) indicate color printing responses to color printing input signals, which is "generating" base on standard (a rule or principle that is used as a basis for judgment set forth by CIE, ASTM).

Therefore, it is respectfully submitted that since Hubble discloses a controller couple or connected photosensor received reflected color which is "received radiation" and the controller converted (i.e. RGB converted to conventional L*a*b*) that indicate color printing responses to color printing input signals base on standard (a rule or principle that is used as a basis for judgment set forth by CIE, ASTM), the limitations such as processor coupled to the sensor for converting the received radiation to a standardized signal indicative of standardized optical density and densitometer generating a standardized signal indicative of standardized optical density of the area

responsive to the illumination are met. As such, the claims are still rejected as shown in the detail above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

May 6, 2008

/TARIFUR R CHOWDHURY/
Supervisory Patent Examiner, Art Unit 2886